

TRANSMITTAL LETTER TO THE UNITED STATES

DESIGNATED/ELECTED OFFICE (DO/EO/US)

CONCERNING A FILING UNDER 35 U.S.C. 371

ATOCM 163

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR

09/423523

INTERNATIONAL APPLICATION NO.

PCT/EP99/02053

INTERNATIONAL FILING DATE

18 MARCH 1999

PRIORITY DATE CLAIMED

26 MARCH 1998

TITLE OF INVENTION

FILM FOR ACCELERATED COMPOST FERMENTATION

APPLICANT(S) FOR DO/EO/US

ISHINO, Kiyotaka et al.



Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 18 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☒ A **FIRST** preliminary amendment.
A **SECOND** or **SUBSEQUENT** preliminary amendment.
16. ☐ A substitute specification.
17. ☐ A change of power of attorney and/or address letter.
18. ☐ Certificate of Mailing by Express Mail
19. ☐ Other items or information:

U.S. APPLICATION NO. (IF KNOWN) SEE 37 CFR

INTERNATIONAL APPLICATION NO.

ATTORNEY'S DOCKET NUMBER

097/423523

PCT/EP99/02053

ATOCM 163

20. The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

- ☒ Search Report has been prepared by the EPO or JPO **\$840.00**
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) **\$670.00**
- ☐ No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) **\$760.00**
- ☐ Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO **\$970.00**
- ☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) **\$96.00**

CALCULATIONS PTO USE ONLY**ENTER APPROPRIATE BASIC FEE AMOUNT =****\$840.00**Surcharge of **\$130.00** for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (e)).☐ 20 ☒ 30**\$130.00**

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	4 - 20 =	0	x \$18.00	\$0.00
Independent claims	1 - 3 =	0	x \$78.00	\$0.00
Multiple Dependent Claims (check if applicable).				\$0.00

TOTAL OF ABOVE CALCULATIONS =**\$970.00**

Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable).

☐**\$0.00****SUBTOTAL =****\$970.00**Processing fee of **\$130.00** for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)).☐ 20 ☐ 30

+

\$0.00**TOTAL NATIONAL FEE =****\$970.00**

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).

☐**\$0.00****TOTAL FEES ENCLOSED =****\$970.00**

Amount to be:

refunded

\$

charged

\$

- ☒ A check in the amount of **\$970.00** to cover the above fees is enclosed.
- ☐ Please charge my Deposit Account No. _____ in the amount of _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.
- ☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **13-3402** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.**SEND ALL CORRESPONDENCE TO:**

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REGISTRATION NUMBER

10 NOVEMBER 1999

DATE

IWM/jvbp
FILED: 11/10/99

IN THE UNITED STATES DESIGNATED OFFICE

In re International Application : PCT/EP99/02053
International Filing Date : 18 March 1999
Priority Date Claimed : 26 March 1998
Applicant(s) (DO/EO/US) : ISHINO, Kiyotaka et al.

For: FILM FOR ACCELERATED COMPOST FERMENTATION

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to calculation of the National fees and examination in the National Phase of the above-identified International Application, please amend this application as follows:

IN THE SPECIFICATION:

Pages 1 through 8, line 1 : Delete the text "Text for foreign filings" from all pages of the application.

Page 1, line 2 : Delete "[Title of the Invention]";

lines 4-6 : Delete in their entirety, i.e., "[Detailed Description....Application];

lines 10 and 11: Delete in their entirety, i.e., "[0002...Art]" and replace with **-- Background of the Invention --** (Centered on the line);

lines 24 and 33: Delete in their entirety, i.e., "[0003]" and "[0004]".

Page 2, line 10 : Delete "[0005]";

line 11 : Delete "[Problem to be Resolved by the Invention]";

line 17 : Delete "[0006]";

line 18 : Delete "[Means for Resolving the Problem]" and replace

with -- **Summary of the Invention** -- (Centered on the line);

- line 27 : Delete "[0007]".
- Page 3, lines 2, 7, 21, 29, 39: Delete parenthetical numbering.
- Page 4, lines 6, 22, 32, 39: Delete parenthetical numbering.
- Page 5, lines 10 and 21: Delete parenthetical numbering;
- line 22 : Change "[Examples]" to -- **Examples** -- (Centered on the line).
- Page 6, lines 5 and 28 : Delete parenthetical numbering;
- line 29 : Change [Example 1, Comparative Example 1] to -- Example 1, Comparative Example 1 --.
- Page 7, line 12 : Change "[Table 1]" to -- **Table 1** -- (Centered on the line).
- Page 8, line 5 : Change "[Table 2]" to -- **Table 2** -- (Centered on the line);
- lines 19 and 20: Delete in their entirety, i.e., "[0021...Invention]".

IN THE CLAIMS:

- Before the claims : Delete "Text for foreign filings" and "[Scope of Claims]" and replace with -- **Claims** --.
- Claim 1, line 1 : Change "[Claim 1]" to -- 1. --.
- Claim 2 : Please rewrite the claim as follows:

[[Claim 2]] 2. (Amended) Film according to Claim 1, wherein [which is characterized in that] the polymer containing polyether chains as structural units comprises at least one member [is of at least one type] selected from the group consisting of [comprising] polyetherpolyamide block copolymers, polyetherpolyester block copolymers and polyetherurethanes.

- Claim 3, line 1 : Change "[Claim 3]" to -- 3. --.

Please add the following new claim:

-- 4. A method of composting comprising providing a heap of compostable matter and covering the heap with a film according to Claim 1. --.

IN THE ABSTRACT:

Lines 1-6 : Delete in their entirety, i.e., "Text for filings.. underground water."
Before line 7 : Insert -- **Abstract of the Disclosure** -- (Centered on the line).
Line 7 : Delete "[Constitution]".
Line 15 : Delete, i.e., "[Selected Drawing]None".

R E M A R K S

The purpose of this Preliminary Amendment is to provide editorial changes and new method claim 4.

Respectfully submitted,



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Filed: **November 10, 1999**

k:\pat\atocm\163\preliminary amendment

[Title of the Invention]

FILM FOR ACCELERATED COMPOST FERMENTATION

[Detailed Description of the Invention]

[0001]

[Industrial Field of Application]

The present invention relates to film for accelerated compost fermentation. The objective thereof lies in shortening the fermentation period and preventing underground water pollution.

[0002]

[Prior-Art]

Compost is obtained by aerobic microbial fermentation after mixing straw, rice chaff, weeds or the like with the excreta of domestic animals. Consequently, for obtaining a good quality compost it is necessary to have sufficient oxygen and a suitable level of temperature and moisture and, hitherto, the following methods have been adopted primarily.

First of all, in regard to the traditional method based on forming a heap, there has been the problem that, when the weather is fine, the surface dries out and hardens, so that air (oxygen) cannot readily pass into the interior and the fermentation is slowed, while, when it is raining, the moisture soaks into the interior, so that the composting materials are cooled and the fermentation is incomplete. Moreover, contaminated water soaks underground, which brings about the problem of under-ground water pollution.

[0003]

To overcome such difficulties, covering with polyvinyl chloride or polyethylene sheet has been tried to some extent but, with such sheet, not only is there a build-up of water vapour and carbon dioxide in the interior when the weather is fine but also the supply of oxygen is inadequate, so that aerobic fermentation by the micro-organisms is impeded and therefore the sheet has to be removed. However, at night, to cope with when it rains, it is necessary to cover over with the sheet again, so there is the problem of the nuisance of having to place and then remove the sheet.

[0004]

On the other hand, methods have been proposed using special apparatus and equipment, so that air is circulated and the temperature controlled, and these methods are to some extent being employed in practice (see, for example, Japanese Unexamined Patent Publication Nos 55-51788, 57-123883,

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60-260490, 3-237081, 3-261690, 4-59685, 5-170585, 7-277866, 7-98711 and 2524040).

At the same time, methods for accelerating fermentation using microbial decomposition accelerators have also been tried, as described in Japanese Unexamined Patent Publication No. 9-110571.

However, not only do these methods generally require equipment investment by the farmer, but also the procedure is complex and the equipment maintenance requires time, so a more simple, improved, method has been demanded.

[0005]

[Problem to be Resolved by the Invention]

The present inventors have carried out a painstaking investigation aimed at providing protection from rain-water by a simple method and shortening the fermentation time, as a result of which they have discovered that by using a film which is water impermeable but through which water vapour and gases can pass, this objective is realised. The present invention is based on this discovery.

[0006]

[Means for Resolving the Problem]

The present invention is a film for accelerated compost fermentation which is characterized in that it comprises a composition in which the chief component is polymer containing polyether chains as structural units, and the water vapour permeability thereof is at least 300 g/m².24h, the oxygen permeability is at least 1,000 cm³/m².24h.atm and the carbon dioxide permeability is at least 10,000 cm³/m².24h.atm; together with film for accelerated compost fermentation which is characterized in that the aforesaid film is reinforced by means of a nonwoven material or net.

[0007]

In the present invention, "polymer containing polyether chains as structural units" refers to a block copolymer in which polyoxyalkylene chains and other polymer chains are linked together, or polymer in which polyoxyalkylene chains are linked together via connecting regions. As examples of the polyoxyalkylene here, there are poly-oxyethylene, poly(1,2- and 1,3-oxypropylene), polyoxy-tetramethylene, polyoxyhexamethylene, block or random copolymers of ethylene oxide and propylene oxide, and block or random copolymers of ethylene oxide and tetra-hydrofuran. In particular, it is preferred that the number of carbons in the alkylene moiety be from 2 to 4, with polyoxyethylene being most preferred. The number average molecular weight of the polyoxyalkylene is from 200 to 6000, and preferably from 300 to 4000.

[0008]

In the present invention, as examples of desirably used "polymer containing polyether chains as structural units" there are polyetherpolyamide block copolymers, polyether-polyester block copolymers and polyetherurethanes. Of these, the polyetherpolyamide block copolymers are particularly preferred.

[0009]

The "polyetherpolyamide block copolymers" used in the present invention are polymers in which there are linked together polyoxyalkylene chains (a) and polyamide chains (b) which are the polymers of aminocarboxylic acids or lactams with 6 or more carbon atoms, or of the salts of dicarboxylic acids and diamines with 6 or more carbon atoms. Where (a) and (b) are mutually connected via a dicarboxylic acid (c) having from 4 to 20 carbons, the polymer is generally referred to as a polyetherester-amide, and such polymer is also included. Here, as the "aminocarboxylic acids or lactams with 6 or more carbon atoms, or salts of dicarboxylic acids and diamines with 6 or more carbon atoms", 11-aminoundecanoic acid, 12-aminododecanoic acid, caprolactam, laurolactam, the salt of hexamethylenediamine + adipic acid and the salt of hexamethylenediamine + sebacic acid are preferably used. Again, there may be jointly used two or more types of aforesaid components (a) and (b).

[0010]

Such polymer may be produced, for example, by the method described in Japanese Examined Patent Publication No. 56-45419. The type and weight ratio of the polyether component and the polyamide component in the block copolymer used in the present invention are selected according to the objectives and the application. From the point of view of water vapour permeability, gas permeability, water resistance and handling properties, etc, the ratio of the polyether/polyamide is preferably from 4/1 to 1/4.

[0011]

The "polyetherpolyester block copolymer" used in the present invention is one in which there are linked together polyoxyalkylene chains (a) and polyester chains (d) comprising polymer of a hydroxycarboxylic acid with at least six carbons or of a dihydroxy compound with at least two carbons and an aromatic dicarboxylic acid. Again, in regard to these (a) and (d) components, two or more types may be jointly employed. Such polymer is produced for example by the method described in US Patent 4,739,012. The weight ratio of the aforesaid (a) and (d) components in the block copolymer employed in the present invention is determined by the objectives and the application.

[0012]

The 'polyetherurethane' employed in the present invention is a thermoplastic polyurethane employing polyether as the soft segments, but there is little effect with a polyester type or caprolactone type even though they are also polyurethanes. Specifically, the polyurethanes are normally obtained by the reaction of an organic diisocyanate and a polyether of molecular weight from

500 to 6000 with, in some cases, the chain extension being carried out in the presence of catalyst. As the isocyanate, there is preferably employed tolylene diisocyanate, diphenylmethane diisocyanate or the like, and as the polyether there is preferably used polytetramethylene glycol or polypropylene oxide, etc.

[0013]

In the present invention, "composition in which the chief component is polymer containing polyether chains as structural units" means a polyetherpolyamide block copolymer, polyetherpolyester block copolymer or polyetherurethane on its own, a mixture of these, or, in the case of the block copolymers, mixtures of two types of polymer in which the resin soft segment/hard segment type or content differs. It also includes blends with some other resin. As examples of the resins which can be blended to produce the composition, there are polyolefins such as polyethylene and the copolymers of polyethylene and acrylate. In the case where blending is carried out with another resin, there may also be incorporated a compatibilizing agent such as an ethylene copolymer or graft copolymer with unsaturated epoxy groups or acid anhydride groups, or an acrylate copolymer.

The type and ratio of the resin other than the polymer with polyether structural units will be selected such that the water vapour and gas permeabilities lie within the following ranges.

[0014]

The film of the present invention needs to have a water vapour permeability of at least 300 g/m².24h, an oxygen permeability of at least 1,000 cm³/m².24h.atm and a carbon dioxide permeability of at least 10,000 cm³/m².24h.atm. Preferably, the water vapour permeability is at least 1000 g/m².24h, the oxygen permeability is at least 3,000 cm³/m².24h.atm and the carbon dioxide permeability is at least 30,000 cm³/m².24h.atm, and more preferably the water vapour permeability is at least 2000 g/m².24h, the oxygen permeability is at least 5,000 cm³/m².24h.atm and the carbon dioxide permeability is at least 50,000 cm³/m².24h.atm.

[0015]

If the water vapour permeability is less than 300 g/m².24h, then the interior moisture will increase. If the carbon dioxide permeability is less than 10,000 cm³/m².24h.atm, there is a build-up of carbon dioxide gas in the interior and if the oxygen permeability is less than 1,000 cm³/m².24h.atm, then there is an insufficient supply of oxygen to the interior, so that anaerobic fermentation occurs and a good quality compost is not obtained.

[0016]

In the composition in which the chief component is polymer containing polyether chains as structural units, there may be freely included known antioxidants, thermal decomposition preventives, ultraviolet absorbers, hydrolysis resistance improvers, colouring agents (dyes and pigments), antistatic agents, electro-

conductors, crystallization nucleating agents, crystallization promoters, plasticizers, ready slip agents, lubricating agents, release agents, flame retardants and flame retarding auxiliaries, within a range such that the characteristics of the present invention are not impaired. In regard to the method for producing film from this composition, there can be used the T-die extrusion method or the inflation method, with film formation being conducted by passage through a T-die or an inflation die, etc. The extrusion temperature will depend on the resin type and the blending ratio but, in general, it is from 120 to 250°C.

[0017]

The film of the present invention is mostly used outdoors, so in cases where strength is required it is still more effective to carry out reinforcement with a nonwoven material or net. As the nonwoven material, there can be used one which comprises polyamide or polyester fibre. A polyolefin net or the like can also be used.

In the case of a nonwoven material or net, a two layer structure (with the nonwoven material or net on the outside) or a three layer structure (with the film interposed between nonwoven material or net) may be used. However, it is necessary to select a material, form and thickness such that the water vapour and gas permeability are not impaired.

[0018]

[Examples]

Below, the present invention is explained by means of examples but it goes without saying that the present invention is not to be restricted just to these. Now, in the examples, the various properties were measured by the following methods.

(1) Water vapour permeability (units: g/m².24h)

The film was subjected to measurement under conditions B (40°C, 90% relative humidity) based on JIS Z0208.

(2) Gas permeability (units: cc/m².24h.atm or %)

Measurement was carried out by the pressure difference method. The specific conditions were as follows.

Equipment: gas permeability measurement device model GTR-10XE produced by the Yanako Bunseki Kogyo (Co.).

Measurement area: 15.2 cm² (44 mm diameter)

Detection method: calibration curve method based on a gas chromatograph fitted with a TCD

Temperature, relative humidity: 25°C, 0% RH

Carrier gas: helium, 70 KPa

Diffusion gas: CO₂/O₂/N₂/C₂H₄ (30.0/30.0/39.12/0.88 vol%)

[0019]

Further, the films employed in the present invention were as follows.

A-1: Film of thickness 25 microns comprising polyetherester-polyamide block copolymer consisting of polyoxyethylene chains and polyamide 12 chains (weight ratio 1/3)

The permeabilities of this film were as follows.

water vapour permeability: 5,100 g/m².24h
oxygen permeability: 3,700 cm³/m².24h.atm
carbon dioxide permeability: 55,000 cm³/m².24h.atm

A-2: Film of thickness 25 microns comprising a composition consisting of polyetherester-polyamide block copolymer composed of polyoxyethylene chains and polyamide 12 chains (weight ratio 1/1), and ethylene-butyl acrylate copolymer, (weight ratio of composition = 65/35)

The permeabilities of this film were as follows.

water vapour permeability: 4,000 g/m².24h
oxygen permeability: 109,000 cm³/m².24h.atm
carbon dioxide permeability: 27,000 cm³/m².24h.atm

A-2: Film A-2 laminated and reinforced with a polyamide 6 nonwoven

B-2: Commercial plasticized vinyl chloride film for agriculture

water vapour permeability: 40 g/m².24h
oxygen permeability: 1,800 cm³/m².24h.atm
carbon dioxide permeability: 12,000 cm³/m².24h.atm

[0020]

[Example 1, Comparative Example 1]

Composts were prepared in five sections, in each of which had been compressed compost material comprising straw mixed with cow dung to a size of height about 2 m, width about 3 m and length about 20 m, and covered respectively with A-1, A-2, A-3, B-1 and B-0 [compost heap with no film]. Now, excepting that turning of the heap was carried out every month, they were left covered with the film. On each such occasion, the compost weight and the compost

composition (moisture, organic material and chief inorganic materials content) were measured. Further, the temperature of the compost was monitored with a temperature sensor.

In the case of the A-1, A-2 and A-3 composts, at the time of the third monthly turning of the heap, the straw had decomposed for the most part and it was concluded that the fermentation had proceeded fully. Now, when exposed to a strong wind, A-2 was seen to have suffered some damage, but no damage was noted for A-3 which was reinforced with a nonwoven material.

Table 1 shows the change in compost weight, moisture content and temperature for A-1, B-0 and B-1.

[Table 1]

Change in Compost Weight, Moisture and Temperature

	A-1	B-0	B-1
Total Weight (1)			
after 0 month	100	100	100
after 1 month	81	87	89
after 2 months	74	85	84
after 3 months	62	84	76
Moisture %			
after 0 month	66	62	70
after 1 month	60	67	66
after 2 months	65	63	65
after 3 months	64	65	67
Temperature °C			
0-1 months	40-60	45-65	30-55
1-2 month	35-58	25-55	30-45
2-3 months	20-40	3-35	20-30

1) The weight at 0 month being taken as 100%

From Table 1, the weight reduction was most rapid in section A-1 compared to the others. This was because the water vapour permeability was high but there was no penetration of rain water. Furthermore, the moisture content was largely kept constant at a suitable level, and the temperature too moved within a reasonable range of 40-60°. For these reasons, it is concluded that microbial fermentation occurred rapidly. Moreover, in terms of the weight reduction, since after 3 months this had already reached the same level as ordinary completely composted material, it was concluded that the fermentation was complete. On the other hand in the case of section B-1, since the moisture vapour permeability was low, moisture evaporation was suppressed and the reduction in weight was

slow. Moreover, since the temperature was low, it is thought that there was little heat evolution due to aerobic fermentation by the micro-organisms. Table 2 shows the compositions of the composts after 3 months for A-1, B-0 and B-1.

[Table 2]

Compost Composition

	A-1	B-0	B-1	Good Compost
total carbon (%)	24.5	23.3	26.5	30-40
total nitrogen (%)	2.2	1.8	1.9	≥2.2
CaO (%)	2.9	2.5	2.7	≥2.4
K ₂ O (%)	4.2	4.1	4.5	≥4.0
electrical conductivity ms/cm.s	8.2	6.7	7.1	≥7.8

From Table 2, it can be seen that although the total carbon in section A-1 was slightly low, the total nitrogen exceeded 2% and the CaO and K₂O were at least the specified values, while electrical conductivity which indicates activity was 8 ms/cm.s, and so a good compost was obtained. On the other hand, in the case of B-0 and B-1, the total nitrogen and the electrical conductivity were low and a good compost was not obtained after 3 months.

[0021]

[Effects of the Invention]

As explained above, by employing film through which water does not pass but through which water vapour and gas can permeate, the present invention offers simple protection against rainwater and shortens the fermentation period.

[Scope of Claims]

[Claim 1] Film for accelerated compost fermentation which is characterized in that it comprises a composition in which the chief component is polymer containing polyether chains as structural units, and the water vapour permeability thereof is at least $300 \text{ g/m}^2.24\text{h}$, the oxygen permeability is at least $1,000 \text{ cm}^3/\text{m}^2.24\text{h.atm}$ and the carbon dioxide permeability is at least $10,000 \text{ cm}^3/\text{m}^2.24\text{h.atm}$.

[Claim 2] Film according to Claim 1 which is characterized in that the polymer containing polyether chains as structural units is of at least one type selected from the group comprising polyetherpolyamide block copolymers, polyetherpolyester block copolymers and polyetherurethanes.

[Claim 3] Film according to Claim 1 where the film of Claim 1 is reinforced by means of a nonwoven material or net.

0342523.070500

Abstract Document

[Abstract]

[Objective] The objective of the present invention lies in shortening the compost preparation period by a simple method and preventing contamination of underground water.

[Constitution] Film for accelerated compost fermentation which is characterized in that it comprises a composition in which the chief component is polymer containing polyether chains as structural units, and where the water vapour permeability thereof is at least 300 g/m².24h, the oxygen permeability is at least 1,000 cm³/m².24h.atm and the carbon dioxide permeability is at least 10,000 cm³/m².24h.atm; together with film for accelerated compost fermentation which is characterized in that the aforesaid film is reinforced by means of a nonwoven material or net.

[Selected Drawing]None

005010.0252210

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY
(Includes Référence to PCT International Applications)

09 JUL 2000
000023
ATTORNEY'S DOCKET NUMBER
ATOCM 163

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought of the invention entitled:

FILM FOR ACCELERATED COMPOST FERMENTATION

the specification of which (check only one item below):

- ☐ is attached hereto.
- ☐ was filed as United States application

Serial No. _____

on _____

and was amended

on _____ (if applicable).

- ☐ was filed as PCT international application No. PCT/EP99/02053, on 18 March 1999,

and was amended under PCT Article 19

on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim priority benefits under Title 35, United States Code, §119 of the following United States Provisional Application and of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR U.S. PROVISIONAL AND FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119
Japan	10-078743	26 March 1998	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO

Combined Declaration For Patent Application and Power of Attorney (Continued)

ATTORNEY'S DOCKET NUMBER

ATOCM 163

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED

PCT APPLICATION NO.	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED (if any)			

POWER OF ATTORNEY As a named inventor, I hereby appoint L. William Millen (19.544), John L. White (17.746), Anthony J. Zelano (27.969), Alan E. J. Brangan (20.565), John R. Moses (24.983), Harry B. Shubin (32.004), Brian P. Heaney (32.542), James T. Traverso (30.595), John A. Sopp (33.103), Richard M. Levovitz (37.067), John H. Thomas (33.460), Catherine M. Joyce (40.668), Richard T. Moore (35.619), James E. Ruland (37.432), Nancy Axelrod (44.014) and Jennifer J. Brangan (40.921) to prosecute this application and transact all business in the Patent and Trademark Office connected herewith.

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Combined Declaration for Patent Application and Power of Attorney (Continued)

(Includes Reference to PCT International Applications)

ATTORNEY'S DOCKET NUMBER

ATOCM 163

205	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
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	POST OFFICE ADDRESS	STREET	CITY	STATE & ZIP CODE/COUNTRY
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	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	STREET	CITY	STATE & ZIP CODE/COUNTRY
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	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	STREET	CITY	STATE & ZIP CODE/COUNTRY
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	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	STREET	CITY	STATE & ZIP CODE/COUNTRY

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

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SIGNATURE OF INVENTOR 202	DATE	SIGNATURE OF INVENTOR 208	DATE
<i>T. W. Schier</i>	June 1, 2000		
SIGNATURE OF INVENTOR 203	DATE	SIGNATURE OF INVENTOR 209	DATE
<i>J. Schier</i>	June 3, 2000		
SIGNATURE OF INVENTOR 204	DATE	SIGNATURE OF INVENTOR 210	DATE
<i>T. Schier</i>	June 12, 2000		
SIGNATURE OF INVENTOR 205	DATE	SIGNATURE OF INVENTOR 211	DATE
SIGNATURE OF INVENTOR 206	DATE	SIGNATURE OF INVENTOR 212	DATE